T04D06 – IB Practice for Topic 04 MS

1. (a) (i) A – sodium iodide, B – sodium, C – iodine (*three correct **[1]***); 1

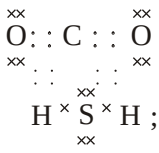
Accept correct formulas.

(ii) A – ionic bonding;
B – metallic bonding;
C – van der Waals' forces (and covalent bonding); 3

(b) (i) (for Na) (lattice of) positive ions/atoms;
delocalized/free electrons/sea of electrons;
(for NaI) oppositely charged ions/positive and negative ions;
free to move (only) in molten state; 4

(ii) forces between I_2 molecules are weak;
ionic/metallic bonding strong(er); 2

[10]

2. (i)  ; 2

Accept dots, crosses, a combination of dots and crosses or a line to represent a pair of electrons.

(ii) CO_2 is linear;
two charge centres or bonds and no lone pairs (around C);
H_2S is bent/v-shaped/angular;
two bond pairs, two lone pairs (around S); 4

(iii) CO_2 is non-polar, H_2S is polar;
bond polarities cancel CO_2 but not in H_2S; 2

[8]

3. delocalized electrons;
(attracted) to positive ions;
more delocalized/mobile/outer shell electrons/higher ionic charge; 3

[3]

4. *Electrical conductivity:*
Bonding electrons are delocalised;
Current flow occurs without displacement of atoms within the metal/
able to flow within the metal;
Malleability:
Can be <u>hammered</u> into thin <u>sheets</u>;
atoms capable of slipping with respect to one another; 4

[4]